

INTERNATIONAL SEARCH REPORT

International Application No

CT/EP 03/13983

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7	C22B1/10	C22B5/14	C22B34/12	F27B15/02	F27B15/10
	B01J8/18	C21B13/00			

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 C22B F27B B01J C21B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

WPI Data, EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	GB 1 502 576 A (TITANIUM TECH LTD) 1 March 1978 (1978-03-01) claims 1-5; example II —	1,11
A	VIJAY P L ET AL: "PREOXIDATION AND HYDROGEN REDUCTION OF ILMENITE IN A FLUIDIZED BED REACTOR" METALLURGICAL AND MATERIALS TRANSACTIONS B: PROCESS METALLURGY & MATERIALS PROCESSING SCIENCE, THE MATERIALS INFORMATION SOCIETY, US, vol. 27B, no. 5, 1 October 1996 (1996-10-01), pages 731-738, XP000632260 ISSN: 1073-5623 page 732; figures 1,5,6,8; tables V,VI — —/—	1,7-11

Further documents are listed in the continuation of box C.

Patent family members are listed in annex.

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Date of the actual completion of the international search

3 May 2004

Date of mailing of the international search report

12/05/2004

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax: (+31-70) 340-3016

Authorized officer

Bombeke, M

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 4 676 824 A (HIRSCH MARTIN ET AL) 30 June 1987 (1987-06-30) column 4, line 35 -column 5, line 20; figure 1 column 2, line 12 - line 50 ---	33-37
A		2-4
X	US 3 578 798 A (LAPPLE WALTER C ET AL) 18 May 1971 (1971-05-18)	28-32
A	column 1, line 65 -column 2, line 75; figures 1,3 column 4, line 26 - line 44 ---	5
X	US 2 607 666 A (MARTIN HOMER Z) 19 August 1952 (1952-08-19) figure 1 ---	28-30
Y	US 4 789 580 A (HIRSCH MARTIN ET AL) 6 December 1988 (1988-12-06) abstract; figure 1 ---	33-37
A		1,11
Y	US 4 044 094 A (BARNER HERBERT E ET AL) 23 August 1977 (1977-08-23) figures 3-5,7 ---	33-37
Y	US 5 603 748 A (HIRSCH MARTIN ET AL) 18 February 1997 (1997-02-18) column 7 -column 8; figure 1 column 3, line 22 - line 59 ---	33-37
A		2-4
Y	US 6 110 413 A (CHOI NAG JOON ET AL) 29 August 2000 (2000-08-29) figures 1-3 -----	33-37

INTERNATIONAL SEARCH REPORT

International Application No

CT/EP 03/13983

Patent document cited in search report		Publication date		Patent family member(s)	Publication date
GB 1502576	A	01-03-1978		AU 504225 B2 AU 1797276 A BE 847207 A1 CA 1077239 A1 DE 2644581 A1 FR 2328048 A1 IT 1069022 B JP 52049997 A NL 7611451 A NO 763518 A ,B,	04-10-1979 06-04-1978 31-01-1977 13-05-1980 28-04-1977 13-05-1977 21-03-1985 21-04-1977 19-04-1977 19-04-1977
US 4676824	A	30-06-1987		DE 3428782 A1 AU 572324 B2 AU 4574385 A BR 8503668 A CA 1244653 A1 CN 85104824 A ,B DE 3562491 D1 EP 0171097 A1 IN 162716 A1 PH 23688 A ZA 8505861 A	13-02-1986 05-05-1988 06-02-1986 06-05-1986 15-11-1988 17-12-1986 09-06-1988 12-02-1986 02-07-1988 27-09-1989 29-04-1987
US 3578798	A	18-05-1971		NONE	
US 2607666	A	19-08-1952		US 2582710 A	15-01-1952
US 4789580	A	06-12-1988		DE 3540541 A1 AU 588647 B2 AU 6513486 A BR 8605633 A CA 1266368 A1 DE 3662700 D1 EP 0222452 A1 GR 88300159 T1 GR 3000079 T3 IN 166635 A1 NO 864490 A ,B, NZ 217937 A	21-05-1987 21-09-1989 21-05-1987 18-08-1987 06-03-1990 11-05-1989 20-05-1987 08-03-1989 31-10-1990 30-06-1990 18-05-1987 27-07-1989
US 4044094	A	23-08-1977		AU 503630 B2 AU 8421675 A CA 1050281 A1 DE 2537940 A1 FR 2283235 A1 GB 1510026 A JP 51050203 A ZA 7505336 A	13-09-1979 24-02-1977 13-03-1979 11-03-1976 26-03-1976 10-05-1978 01-05-1976 28-07-1976
US 5603748	A	18-02-1997		DE 4320359 C1 DE 4410093 C1 AU 673921 B2 AU 6479594 A DE 59403432 D1 DK 630975 T3 EP 0630975 A1 TT 4894 B US 5527379 A	20-10-1994 09-03-1995 28-11-1996 22-12-1994 28-08-1997 01-09-1997 28-12-1994 16-06-1994 18-06-1996

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/EP 03/13983

Patent document cited in search report	Publication date		Patent family member(s)	Publication date
US 5603748	A	US	5560762 A	01-10-1996
US 6110413	A	29-08-2000	KR 276339 B1 AU 706405 B2 AU 5344098 A BR 9707602 A CA 2247152 A1 CN 1211283 A ,B CZ 9803022 A3 EP 0914477 A1 JP 11504393 T JP 3185058 B2 WO 9828449 A1 RU 2158769 C2 SK 111598 A3 TW 387014 B ZA 9711487 A	15-12-2000 17-06-1999 17-07-1998 27-07-1999 02-07-1998 17-03-1999 11-08-1999 12-05-1999 20-04-1999 09-07-2001 02-07-1998 10-11-2000 07-05-1999 11-04-2000 01-07-1998